

What is claimed is:

1. An over-coating composition for coating a photoresist composition to provide a vertical photoresist pattern, said over-coating composition comprising an over-coating resin, a solvent, and a basic compound.

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2. The over-coating composition according to claim 1, wherein said over-coating resin is a water-soluble polymer.

3. The over-coating composition according to claim 1, wherein said over-coating resin is poly(acrylic acid / methyl acrylate).

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4. The over-coating composition according to claim 1, wherein pKa of the conjugate acid of said basic compound is about 13 or less.

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5. The over-coating composition according to claim 1, wherein said basic compound is a nitrogen containing compound.

6. The over-coating composition according to Claim 1, wherein said basic compound is selected from the group consisting of an amine compound; an amide compound; a urethane compound; derivatives and salts thereof; and mixtures thereof.

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7. The over-coating composition according to claim 6, wherein said amine compound is of the formula:



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wherein each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is independently H, or C<sub>1</sub>-C<sub>20</sub> alkyl.

8. The over-coating composition according to claim 7, wherein said alkyl is selected from the group consisting of unsubstituted C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>1</sub>-C<sub>20</sub> hydroxyalkyl, C<sub>1</sub>-C<sub>20</sub> alkyl carboxylic acid, C<sub>1</sub>-C<sub>20</sub> aminoalkyl, C<sub>1</sub>-C<sub>20</sub> alkylketone, and C<sub>1</sub>-C<sub>20</sub> alkylester.

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9. The over-coating composition according to claim 6, wherein said amine compound is selected from the group consisting of L-proline, tetraalkylammonium salt, tri(hydroxyalkyl)ammonium salt, and mixtures thereof.

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10. The over-coating composition according to claim 9, wherein said tetraalkylammonium salt is selected from the group consisting of tetramethylammonium hydroxide and tetramethylammonium hydroxide pentahydrate.

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11. The over-coating composition according to claim 9, wherein said tri(hydroxyalkyl)ammonium salt is triethanolamine.

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12. The over-coating composition according to claim 1, wherein the amount of said basic compound is in the range from about 0.001 to about 0.1 mol% of said solvent.

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13. The over-coating composition according to claim 1, wherein the amount of said solvent is in the range from about 1000 to about 7000% by weight of said over-coating resin.

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14. A process for forming a photoresist pattern, comprising the steps of:  
(a) coating a photoresist composition on a substrate to form a photoresist film;

(b) coating an over-coating composition on the upper portion of said photoresist film to form a over-coating, wherein said over-coating composition comprises an over-coating resin, a solvent, and a basic compound;

(c) exposing said over-coated substrate to light using a light source; and  
(d) developing said exposed over-coated substrate.

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15. The process according to claim 12, wherein said photoresist composition comprises a chemically amplified photoresist resin.

16. The process according to claim 15, wherein said chemically amplified photoresist resin is poly(tert-butyl bicyclo[2.2.1]hept-5-ene-2-carboxylate / 2-hydroxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate / bicyclo[2.2.1]hept-5-ene-2-carboxylic acid / maleic anhydride).

17. The process according to claim 14 further comprising a baking step before and/or after said exposure step (c).

18. The process according to claim 17, wherein said baking step is performed at a temperature range of from 10 to 200°C.

19. The process according to claim 14, wherein said light source is ArF, KrF, F<sub>2</sub>, EUV, E-beam, X-ray or ion beam.

20. A semiconductor element manufactured by the process according to claim 14.